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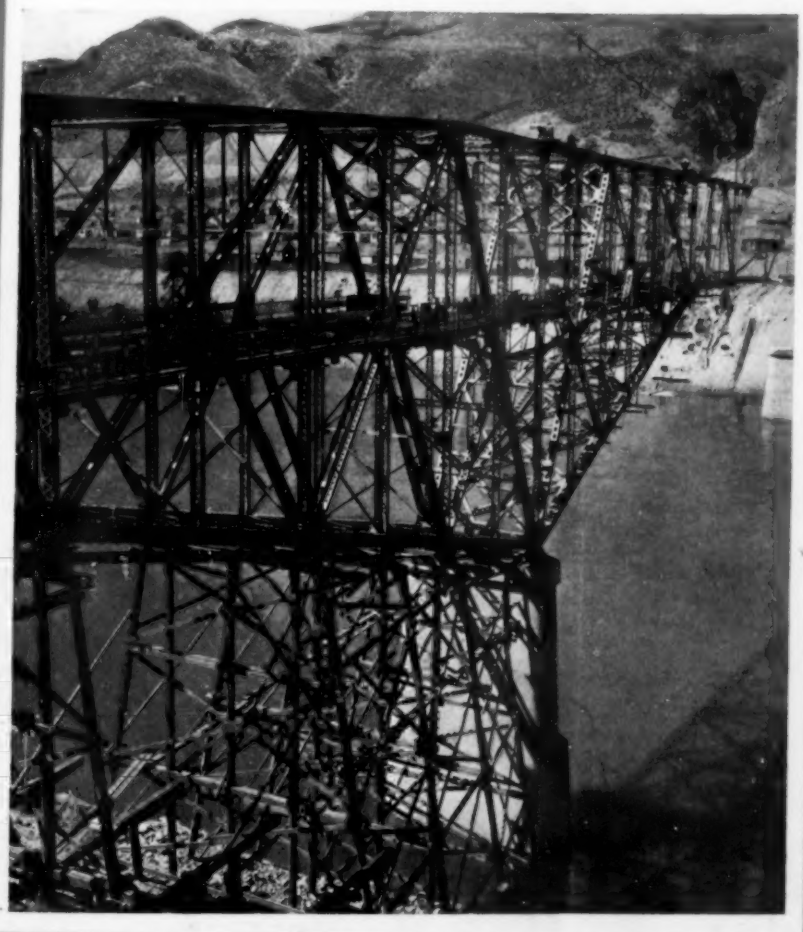
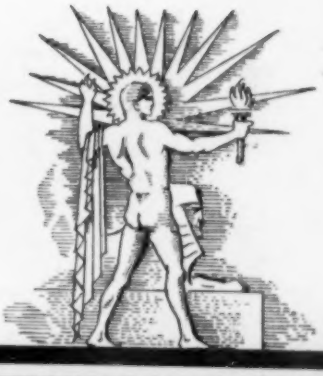
# SCIENCE NEWS LETTER

THE WEEKLY SUMMARY OF CURRENT SCIENCE •





SEPTEMBER 28, 1935

**New Bridge at Grand Coulee**

See Page 197

A SCIENCE SERVICE PUBLICATION

# SCIENCE NEWS LETTER

*VOL. XXVIII* *No. 755*

The Weekly Summary of Current Science

*Published Every Saturday by*

SCIENCE SERVICE

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*Edited by* WATSON DAVIS

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# DO YOU KNOW?

The turtle carries its shoulder blades within its ribs.

The Red Sea gets its name from swarms of minute red algae.

Russia's output of synthetic rubber is expected to be 85,000 tons this year.

Experiments indicate that common rock salt will harden a clay and gravel road to a density almost that of concrete.

The London Zoo is featuring a "pets corner" where boys and girls may make friends with carefully chosen pets, including a chimpanzee and lion cub.

A blind Minnesota farmer, whose land is being used to demonstrate soil erosion control work, is following the project by a Braille map on which the farm features are indicated by raised perforations.

Two English authorities consider whooping cough the most important epidemic disease in London in causing physical suffering, loss of school attendance, impairment of physique and mortality.

The only quicksilver mine in the United States is in Terlingua, Texas.

Tipi rings—circles of stones that once held down the skin or blanket houses of Plains Indians—are still found widely in South Dakota.

A nutrition professor at Columbia University suggests for school lunches a vitamin A sandwich made of whole wheat bread, butter, and spinach.

In Dutch bulb fields, an inspector seeking disease symptoms in the plant leaves carries a huge umbrella, because the conditions show up only in the shade.

The collapse of the Mongols from rulers of a vast empire to their present unimportance is attributed by one Chinese writer to two causes: their Lamaist religion and the spread of syphilis.

So closely guarded is the crop report of the Department of Agriculture that a business man who accidentally entered the room recently found himself a prisoner for six hours, until the release time at three o'clock.

## WITH THE SCIENCES THIS WEEK

*Most articles are based on communications to Science Service or papers before meetings, but where published sources are used they are referred to in the article.*

ARCHAEOLOGY

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ASTRONOMY

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What astronomical discovery is due to the new aluminum coat for telescope mirrors? p. 200.

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Is a deuteron a hard, round particle? p. 195.

PHYSIOLOGY

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What kinds of food are disliked by college girls? p. 201.

Why is it easier to sunburn after swimming? p. 201.

POULTRY HUSBANDRY

For what purpose are chickens tattooed? p. 200.

PSYCHOLOGY

Is "G" the same as intelligence? p. 196.

What branch of science has been neglected in the brain trust? p. 204.

RADIO

In what manner was a photograph radioed to New York and London simultaneously? p. 200.

SURGERY

Could you make yourself a satisfactory nose? p. 201.

PHYSICS

# Electric Charge Sorts Proton From Neutron in Atom Assault

## New Theory Explains How Deuteron "Bullets" Can Pierce Barrier Wall Guarding the Nuclei of Atoms

MODERN alchemy, the transmutation of one chemical element into another by bombardment with high-speed subatomic "bullets," is made possible by an electrical sorting arrangement inside each atom.

How the subatomic sorter helps weed out parts of the incoming atom bullets and allows others to enter the nucleus and create a different, heavier atom, is explained by a new theory just announced at the University of California.

Drs. J. R. Oppenheimer and M. Phillips disclose how their explanation of the sorter's operation clears up a mystery of certain experiments performed by their colleagues, Prof. E. O. Lawrence, Dr. Edwin McMillan and Dr. R. L. Thornton. (*Physical Review, Sept.* 15).

Prof. Lawrence's research had found many cases where an element, bombarded with deuterons from his giant sling-shot accelerator, was increased in mass by a unit of one. Thus, aluminum of mass 27, when struck by a deuteron of mass two, turned into aluminum of mass 28 and released a hydrogen particle of mass one, a proton.

Similarly sodium, whose chemical symbol is Na, entered into bombardment reactions of the type: $Na^{23}$ plus $H^2$ produces $Na^{24}$ plus $H^1$. In each case part of the deuteron ($H^2$) was captured and went to form a heavier atom, while the rest of the deuteron turned into a proton ($H^1$).

### Not a Single Particle

As explanation, Drs. Oppenheimer and Phillips suggest that the deuteron is not really a single particle but a composite unit containing a neutron and a proton; the proton having electrical charge and the neutron being without one.

Don't think of the deuteron, however, the California scientists caution, as a round, hard particle; for its wavelike nature means it is not confined to a sharply limited volume. As a matter of fact, there is a good chance that both, or either, the neutron or proton, of which the deuteron is composed, may be some distance away from the deuteron's center of mass.

Coming up to an atom in the target, say an aluminum atom, the neutron and proton in the deuteron particle behave quite differently. The strong electrical barrier of the atom nucleus stops the charged particle, the proton; but it has no effect on the non-electrical neutron. The latter goes right through the barrier, enters the aluminum nucleus, is captured, and in joining creates a new and heavier kind of aluminum, envision Drs. Oppenheimer and Phillips.

One way to think of the atomic happening is to conceive an army half of which consists of men with gas masks and half without. The army is attacking an enemy whose sole defense is a cloud of poison gas thrown up around it. The attacking force comes to the gas cloud. Those parts of the deuteron army with gas masks (the neutrons) can go through the gas (electrical barrier). Those parts without masks (protons) must stay outside and retreat.

The analogy falls down in that one deuteron does not consist of many neutrons and protons but only of a single pair. A stream of deuteron particles, however, might be likened to the attacking army pictured.

How the neutrons get through the barrier has been explained by such theoretical scientists as Prof. George Gamow, of George Washington University, as a diffraction phenomenon of the waves associated with the neutron. Such a picture explained many of the atomic bombardment experiments until the latest ones of Prof. Lawrence and his co-workers on aluminum.

### Deceleration a Factor

Drs. Oppenheimer and Phillips in their new theory show mathematically that when a deuteron particle comes to an atom in the target the probability distribution of the neutron's position can be so far from the center of mass of the deuteron particle that it may very well overlap the center of the impacted nucleus. Among other factors bringing this situation about, is the deceleration of the neutron as it enters the target atom. Such a slowing up, they show, tends to increase the probability distribution density on the side of the deuteron nearest the target atom's nucleus.

*Science News Letter, September 28, 1935*

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Experiments using hydrogen peroxide instead of yeast in bread making have been tried at the U. S. Department of Agriculture.

**NASTURTIUMS: A HORTICULTURAL EVOLUTION**

***Ordinary single (left), double (center) and new "super-double" (right). On the super-double nasturtium, which forms no seeds and is propagated only by cuttings, a patent has recently been granted. This is unique in two respects: it is the first nasturtium to be patented, and it is the first flower of any kind in which more than one color is protected by the same patent. This is possible because the super-double plant, though seedless, does form a little pollen, which can be used for cross-fertilizing other varieties, producing a range of colors all the way from light yellow to dark mahogany. The patent has been granted to the president of a well-known Philadelphia seed firm.***

PSYCHOLOGY

# "G," Which is "Mind-Power" Needed in Many Activities

COLLEGE professor and skilled mechanic both need "G."

But this sort of mental "it," which may also be called mind-power, is needed in different amounts as compared with special talents.

Pure physical strength and the sort of fancifulness that enables you to see pictures in clouds or ink blots are the only human abilities encountered in a comprehensive program that do not need "G" at all.

This is the message brought to American psychologists meeting in Ann Arbor, Mich., by Prof. Charles Spearman of the University of London, who addressed the American Psychological Association.

A grand total of 92 tests designed to measure the whole gamut of human abilities was given to twelve hundred students, in the course of Prof. Spearman's research. Every one of the 92 abilities, including such widely different matters as tapping rapidly with a pencil and working arithmetic problems, involved more or less of the General Factor, which Prof. Spearman has made famous as "G."

"G" is not what is generally spoken of as general intelligence, but extends far beyond the range of that ability, Prof. Spearman explained. It is the mental side of what has been called the "mass action" of the brain's whole outer layer or cortex.

Much of what is measured by current tests of intelligence or "IQ" is not the "G" factor at all, but another general factor linked with language. This seems to be nothing more than a capacity to link any symbol with a meaning. Yet it plays a large part in the most exalted mental operations such as reasoning, Prof. Spearman said. It is present in all linguistic activities.

It is not, however, nearly so widely present as is "G," but underlies only about twelve of the abilities tested. It is involved in the ability to acquire general information.

The boy who is bad at arithmetic will not necessarily fail in his geometry tests, Prof. Spearman said. There is no general "mathematical ability." For arithmetic, you need "G" plus a special factor dealing with number. For geometry, you need "G" again, but a special ability for dealing with spatial relations.

Mechanical ability depends again upon the general factor, together with a special facility for understanding and inventing machines.

The idea that talent in music, painting or literature is a special gift is confirmed by Prof. Spearman's research. There is a common factor active in all these three branches of art, but it is not very important. And the amount of "G" involved in any of them is extremely small.

A battery of tests which may be shot at the individual and result in an adequate picture of his entire makeup, to aid in his education and his placement in industry, is one of the aims of his research, Prof. Spearman said. So far only mental abilities have been studied in this research, but further research is already planned covering the equally important traits of character and personality.

*Science News Letter, September 28, 1935*

METALLURGY

# Method for Welding Aluminum Developed in Great Britian

A NEW process for welding the light aluminum alloys like RR 56 and Duralumin, holding promise for airplane and automobile construction, has been perfected in Great Britain, Consul William W. Heard, Birmingham, England, reports.

The new welding material, known as "Alusol," will join aluminum in cast, rolled, sheet or tube form and fluxes freely at 200 degrees Centigrade, according to the U. S. Department of Interior's *Mineral Trade Notes* (Aug. 20).

The method, invented by an unnamed engineer of Coventry, Warwickshire, England, overcomes the old trouble wherein attempts to weld aluminum in ordinary fashion destroyed the effects of the previous heat treatment.

Test pieces of RR 56 and Hiduminum tubing socketed together and joined with Alusol were only pulled apart at forces of twenty-six tons to the square inch, leaving the welded joint intact.

Alusol is claimed to withstand corrosion well and is unaffected by aging.

As an immediate application, it is reported, experiments are under way to produce an all light alloy bicycle which will weigh but four and three-quarter pounds with only the wheels and seat removed. Of more import, however, is the promise which the new joining method holds for aircraft and automobile construction.

The new process is analogous to soldering except that no flux is required. The aluminum alloy surfaces are first cleaned with special emphasis on the removal of oil, and the parts placed in a heating device.

After each part is warmed up the Alusol is rubbed on carefully over the surface with a steel scraper. After coating, the pieces are brought together, heated again, and finally allowed to cool.

It has also been found, the report states, that aluminum tubing can be joined to steel by the method, providing the steel is first tinned with a coat of soft solder. A joint of this character is said to withstand a pull of six tons per square inch.

*Science News Letter, September 28, 1935*

ENTOMOLOGY

## Battling Butterflies Attack Wasps and Birds

BUTTERFLIES that offer to fight wasps, and even birds, sound a bit fabulous—like the traditional rabbit growling at a bulldog. But butterflies do fight, declares Austin Clark, Smithsonian Institution biologist.

Mr. Clark tells of butterflies that "fly at" such well-armed insects as wasps, bees and dragonflies. One species, the common milkweed butterfly, has a special antipathy for hummingbirds, and chases them away whenever they approach the flowers on which it is feeding. Another, the buckeye butterfly, makes a specialty of hazing the Carolina locust, a much larger insect. Many male butterflies are also pugnacious toward each other, and get into endless fights.

The curious part of it all is that the butterflies are quite without stings, biting mouthparts or any other weapons of offense. They fly in the faces of their enemies armed only with a truculent disposition. But apparently their bluff never is called.

*Science News Letter, September 28, 1935*

ASTRONOMY

# Solar Prominence Streamers Linked With Sunspot Centers

## Study of 10,000 Sun Photographs at Yerkes Leads to Discovery of "Signposts" Pointing to Spot Activity

NEW-FOUND solar signposts that point out the location of sunspot activity were described before the American Astronomical Society by Dr. Philip C. Keenan of the University of Chicago's Yerkes Observatory.

The solar signposts are streamers coming out from the sides of the gigantic flames of glowing hot gas known as solar prominences. In some cases the prominences have been known to shoot out from the surface of the sun for distances up to 500,000 miles—more than the radius of the sun.

A study of over 10,000 sun photographs taken at Yerkes Observatory in the last 28 years led to the discovery of the sunspot signposts. Certain types of prominences seen near the sun's east and west edges show streamers moving towards or away from definitely located points on the sun's surface. When these points were checked against sunspot records, Dr. Keenan stated, they proved to be the centers of sunspot activity on the same date that the prominence was observed.

Roughly one can think of the solar prominences as the trunks of enormous trees shooting out from the sun's surface. The streamers, or sunspot signposts, would then be like branches coming out from the trunk; some pointing back toward the sun and others away from it. But the general line either toward or away from the sun is the crucial direction, for it points to the place of sunspot activity. If several such lines could be noted from different streamers the position of the sunspot could be determined by what would be almost similar to solar surveying.

### Near Solar Equator

The type of solar prominence which has the sunspot-indicating streamers is not seen near the sun's north or south poles but only near the equatorial belt. It is thought that the streamers are linked with the magnetic centers associated with sunspot areas. Since the solar prominences are composed of ionized atomic particles, some with positive and some with negative electrical charges, the magnetic field originating from the sunspots makes those of one electrical sign move one way and those of the other sign in the opposite direction. It is this motion of electrical particles in the solar prominences which produced Dr. Keenan's telltale streamers, for as the charged particles move they radiate light. This light can be gathered by the telescope mirror and studied in such instruments as spectro-heliographs in which prominences can be photographed even when a total solar eclipse is not occurring.

In practically every case the actual center of attraction was located in the penumbra or outer part of the sunspot and not in the darkened center of the umbra of the solar disturbances. Dr. Keenan found, however, that some prominences occur as far as ten degrees from the location of a sunspot and considers that sunspots, while generally associated with prominences, are not essential to their formation. The velocity of these condensations of matter moving into the centers of solar disturbances ranged up to nearly 120 miles per second, although the average speed is about 30 miles.

*Science News Letter, September 28, 1935*

ENGINEERING

# Grand Coulee Dam Tops Boulder Dam as "Biggest"

**See Front Cover**

WITH construction on Boulder Dam now virtually complete, Grand Coulee Dam on the Columbia River is stepping to the engineering forefront.

Bids have just been opened by the U. S. Bureau of Reclamation for 4,220,000 barrels of cement for the Grand Coulee Dam. This mammoth order is said to be more cement than was used in the whole Boulder Dam, exclusive of the power plants. Yet it is less than half of what will be needed at Grand Coulee.

Already plans are underway for the utilization of the arid but fertile Columbia River basin after irrigation, made possible by Grand Coulee Dam, becomes a reality. Work relief funds amounting to $250,000 have been authorized for soil classification studies, preparation of better topographic maps and the preparation of a land ownership map.

The cover photograph shows the Government bridge under construction at the damsite. It and the illustration below are official photographs of the U. S. Bureau of Reclamation.

*Science News Letter, September 28, 1935*

SITE OF GRAND COULEE DAM

ETHNOLOGY

# Ethiopia's Alphabet Ingenious

## Sequoyah's Invention For Recording Cherokee Was Thought of First in Africa 2,000 Years Earlier

By EMILY C. DAVIS

REVOLUTIONIZING the alphabet! That is a daring deed in any day and age. But the Ethiopians did it. What is more, the clever old alphabet invention of Ethiopia has been invented all over again in modern America with applause and approval.

Ethiopia's alphabet inventing took place away back at the beginning of the Christian era, says Dr. John P. Harrington, linguistic specialist of the Smithsonian Institution.

"Ethiopians," explains Dr. Harrington, "inherited the old Semitic alphabet in common with the Hebrews, Aramaics, and Arabs. It was a cumbersome system of writing consonants of words and then placing the vowels, if written at all, outside the contours as dots and dashes—not unlike some forms of shorthand. Books in Hebrew are filled with this over-dotting which Germans aptly call 'eye-powder.'

"Ancestors of Emperor Haile Selassie did away with all this bric-a-brac outside the contours of letters, thereby helping eyesight 100 per cent. They noticed that each consonant letter had four corners, and their bright idea was to join a tick to each corner to express one or another of the vowels following the consonant. This gave them an alphabet of syllables, but syllables easy to remember.

"Ethiopians also reversed the order of writing, so that the eye moves from left to right as in modern English print, instead of the reverse as in old Hebrew and modern Yiddish."

### Sequoyah Not First

When the American Indian Sequoyah invented an alphabet for writing the Cherokee Indian language over a hundred years ago, he was repeating the very invention Ethiopians had made some 2,000 years earlier, Dr. Harrington finds. Sequoyah's alphabetic symbols represent a consonant plus a vowel. Unlike the Ethiopians, however, the Indian alphabet maker was weak on system, and his alphabet is about five times as hard to learn as the old Ethiopian product.

It is quite possible, Dr. Harrington believes, that Sequoyah had heard something of the ancient Hebrew and Ethiopian systems from missionaries.

Coming to still more recent times, French Canadian missionaries, among the Cree Indians of the Hudson Bay region, repeated the same discovery in the 1880's. Working in collaboration with Cree Indians themselves, and certainly with some knowledge of Ethiopian and Hebrew writing in the back of their heads—as Dr. Harrington points out—the missionaries invented a system whereby Crees could write their own language. Their system is more like the Ethiopian than Sequoyah's had been. Using simple geometric figures to represent consonants, they turned the consonant symbols in various positions to indicate the vowel following.

### Oldest Language in World

While bold in improving their written language, Ethiopians have conservatively preserved the spoken language of their ancestors down through 7,000 years. Sounds of the oldest language in the world can be heard in the royal palace and churches in the city of Addis Ababa. The words are more primitive in sound and form, says Dr. Harrington, than the dialects of the Semitic language—Hebrew and Aramaic—in which the Bible was written.

"Proto-Semitic" the language student would call these ancient primitive speech forms heard in Ethiopia. By proto-Semitic he means the basic language spoken about 5000 B.C., by people who founded civilization in the Old World.

How can scientists tell what human speech was like in those days, before man had begun to record the sounds of words in systematic writing?

"By a laborious comparison of Hebrew, Babylonian, Arabic, and Aramaic," explains Dr. Harrington, "it is possible to reconstruct definitely the basic language which developed into Semitic languages. Ethiopians in their isolated highland country retained the primitive form of the language as no other people managed to do. The language of the free, as they call it, has come to have seven dialects which depart slightly from ancient forms. But in masses and rituals churches of Ethiopia still use the ancient language of the free in its pure forms."

A strange blending of races, if Italy carries through her project of making Ethiopia a great Italian colony, is foreseen by Dr. Harrington.

"The population of Ethiopia is ten million, of a uniform skin color, rated by anthropological tests a dark yellow brown," says Dr. Harrington. "Suppose Italy establishes a population of ten million Italians in this same area. The experience of Portugal in Africa, and in fact all history, proves that the result will be a blood mixture. Despite slight deviations brought about by social standing, religion, and the Mediterranean feeling of aloofness, it will be merely a matter of time until every individual in this population of colonists has in his veins some percentage of Ethiopian blood.

### Would Penetrate Italy

"And since these people would be a part of greater Italy, with improved means of transportation between the Italian peninsula and Italy of the African mountains, the blend would in time be pretty complete in Italy proper. The Ethiopians by blood would have conquered their conquerors, just as centuries

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ethiopian | ለ la | ሉ lu | ሊ lii | ላ laa | ሌ lee | ል lö | ሎ loo |
| Cherokee | W la | M lu | P li | | ᒐ le | ᗩ lö | G lo |
| Cree | ᒐ la | | ᒐ li | | ᐣ le | | ᐣ lo |

ETHIOPIAN ALPHABET INVENTION

***A slight variation in the writing of a symbol indicates the vowel sound that follows the consonant in these three alphabets based on the same ingenious idea. Here you can see how the letter "L" is written in the three alphabets to express various syllable sounds. The English letters following each symbol show how it is pronounced. Ethiopians, who originated the idea, had the best system, with forms for all vowels. Sequoyah, who invented a similar alphabet for Cherokee Indians, varied his symbols more, making his alphabet harder. Canadian missionaries devised the third system for writing the Cree Indian language.***

ago the Italians by blood conquered the blond and blue-eyed Goths when Gothic kings added Italy to their dominions. Conquest by race is a slower, but surer, conquering agent than arms."

Admitting that this has not occurred in various other parts of Africa, Dr. Harrington finds conditions different. South Africa had a sparse native population, beaten back by British and Boers, and these races have an exceptionally strong tendency to keep aloof from natives in their colonies. Other parts of Africa proved too unhealthy for colonials to settle down permanently in larger numbers. Moslem faith, as in Egypt, acted further as a fairly strong barrier to mixed marriages.

### Favorable Conditions

But in Ethiopia the conditions would favor rather than deter a racial blend, as this anthropologist analyzes the situation. As factors promoting mixture, he cites these: the vast mountain region with a climate that can—by sanitary engineering—be made as healthful as the Swiss Alps; the fairly heavy population of "dark yellow browns," with their Christian religion. Any attempt to dislodge the natives from their age-long homes, to segregate them, would be bitterly fought by them. And forbidding racial mixture would be a gesture inevitably futile.

Two Gibraltars guard the destiny of the British Empire—and the other one is Ethiopia, in the opinion of Dr. Harrington.

### Vital Waterway

"Ethiopia and the rock of Gibraltar guard opposing ends of a waterway vital to the British Empire," he explains. "By her past history, Britain is committed to giving a free and just government to large populations at the extreme west of Europe and in southern Asia and Australia. These two large groups, in East and West, depend on the water road of communication from the Atlantic Ocean through to the Indian Ocean. To complete the highway the expensive Suez Canal was built, and if a single point is blocked from Gibraltar's rock at the Atlantic end, through the Mediterranean, across Suez, down the Red Sea and through the Straits of Bab-el-Mendeb into the Indian Ocean, England would be seriously hampered in her contact with India and her other eastern colonies.

"The Gibraltar of the West is only a rock less than three miles long, but capable of raking far into Africa with its guns. The Gibraltar that protects the eastern end of Britain's water highway is a whole plateau of African mountains—the impregnable fortress of Ethiopia, capable under scientific management of sustaining a population of perhaps up to 50 million people.

"Neighboring African lands are incapable of use to dominate the scene. They are too starkly desert or too insufferably hot or unhealthy. But from Ethiopia, strategically placed to control or close the waterway, guns could be fired over the Red Sea with devasting results to British communications, while a thrust to the west would cut the railway that connects with South Africa. This railway runs almost in the shadow of Ethiopian mountains.

"Equally vital to Britain is Ethiopian Lake Tsana, source of the Blue Nile, which sends its waters into Egypt at just the right time when waters of the Nile derived from other tributaries are getting low. The project of irrigating Egypt in future years takes into account the necessity of harnessing Lake Tsana.

### Free for 3000 Years

"A military coup which could be given from Ethiopia might settle the fate of the British Empire and cut the connection between England and India at a time when this connection was urgently needed. British liberality has left free this country, which is the most important to Britain of all the regions of Africa, but which has an unbroken record of over 3,000 years since it paid tribute to any conquering nation."



## Sounds of Ethiopian Names in the News

**Haile Selassie (Hhay-leh Seh-lah-syeh). Means Power of the Holy Trinity.**
**Addis Ababa (Ahd-dis Ah-bah-bah'). New Flower.**
**Aduwa (Ghad-wah'). Where the Ethiopians repulsed Italy 40 years ago.**
**Tsana (Tsah-nah'). Important lake, source of the Blue Nile.**
**Ethiopia is from Greek words meaning sunburnt or dark face.**

## Sounds of War Words in Ethiopian Speech

**Weh-tad-der'. Soldier, fighter.**
**Tor. Spear.**
**Yeh-medf tor. Artillery; literally "cannon spear."**
**Yeh-bah-buhr'. Airplane pilot.**
**Sam-djah'. Bayonet.**
**Guhd-gwahd'. Trenches.**
**Yel.-'irq mah-gah-nay-nyat'. The peace meeting (League of Nations meeting).**

MEDICINE

## Find Astringents Protect Against Sinus Disease

NEW weapons for the fight against sinus disease were described at the meeting of the American Academy of Ophthalmology and Otolaryngology.

Weak solutions of astringents such as tannic acid and sodium alum greatly diminished the amount of infection in experimental animals when the astringents were used before germs were injected into the sinuses, Drs. Ralph A. Fenton and Olof Larsell of the University of Oregon Medical School reported. These specialists have been conducting a five-year research on sinus disease. The work has been financed by the Academy.

Another weapon which may prove useful is the fluid from the birth sac of animals (sterilized amniotic fluid). Improvement in experimental and human sinus disease was brought about by the local use of this fluid, Drs. Fenton and Larsell reported. The fluid possesses high reparative powers because of its content of so-called growth hormones and active cell juices, they explained.

Similar improvement in sinus disease was noted after the use of certain rare new chemicals resembling ephedrine.

Local use of the quartz light was not found to help in the repair of chronic inflammation. Powerful antiseptics were found almost always irritating when used after sinus inflammation has become established.

GENERAL SCIENCE

## Discuss Science Problems Important to Americas

CROSS-breeding of races and modern immigration policies were among problems of Pan-American importance discussed at the Seventh American Scientific Congress, which met in Mexico City by invitation of the Mexican Ministry of Public Education.

Oil fields and mineral deposits in America, movements of the earth's crust along Pacific and Atlantic shores of the continent, and other subjects of geologic and geographic interest were discussed by specialists in these fields. Legal aspects involved in inter-American communication by highways, railways, airways, waterways, telegraph and radio are being surveyed.

Six official U. S. Government delegates to the Congress included Dr. J. McKeen Cattell, editor of *Science* and president of Science Service; Dr. Walter W. Atwood, noted geographer and president of Clark University, Worcester, Mass.; and Neil M. Judd, curator of archaeology of the U. S. National Museum.

*Science News Letter, September 28, 1935*

PHYSICS

## Light and Flight Clocked Over Same Race-Course

FEW race courses in the world have been more accurately surveyed than the one over which Howard Hughes, millionaire oil man and Hollywood motion picture producer, recently swept to what may be a world's record for land planes, at 352.9 miles per hour.

The reason is that Hughes traveled over the Santa Ana terrain which the late Prof. Albert Michelson used in making his last experiment on determining the velocity of light.

Howard Hughes reached a velocity of nearly one-tenth of a mile a second. If he had averaged 360 miles an hour it would have been exactly that. Prof. Michelson in measuring the speed at which light travels was determining a velocity of approximately 186,000 miles a second.

Hughes, traveling nearly 528 feet a second, attained a velocity comparable to that of a Revolutionary War cannon ball, but he was going only 1/1,860,000 as fast as light.

Prof. Michelson needed, as does anyone who tries to determine a velocity, to know two things: distance and time. Velocity is the ratio of the two—distance/time.

By reflecting light back and forth inside the evacuated mile-long iron tube on the Santa Ana ranch, Prof. Michelson measured time to better than 1/20,000 of a second. A high-speed rotating cylinder of glass, turning 730 times a second, had 32 flat mirror faces ground around the circumference. Light reflected off one mirror surface went eight miles and came back just in time to shine off the next mirror which had turned around into position meanwhile.

For measuring accurately the distance which the light traveled, the U. S. Coast and Geodetic Survey made 56 determinations of the base line from which the length of the mile-long tube was determined. The error in the measurement in length generally is considered to have been between one part in 500,000 and one part in a million: a feat of measurement which is much better than determining the height of an average-size man to within the thickness of a hair on his head.

*Science News Letter, September 28, 1935*

ASTRONOMY

## Telescope's Aluminum Coat Credited With Discovery

THE use of aluminum coating for the giant telescope mirrors instead of silver may be responsible for the newest discovery of astronomy—the finding that the famous ring nebula of the constellation Lyra, which is almost overhead near the bright star Vega, is just about two times as large in diameter as astronomers have previously supposed.

Dr. John C. Duncan of the Whitin Observatory, Wellesley College, Mass., reported to the meeting of the American Astronomical Society that new photographs he had taken only last month at Mt. Wilson Observatory with the 100-inch Hooker telescope disclosed the enlarged size of Lyra's ring nebula.

It is well known that much of the light which makes the nebula shine is in the ultraviolet region of the spectrum. It is invisible to the eye but strongly affects photographic plates.

Photographs taken with the new aluminum coating on the 100-inch telescope disclose, for the first time, just how big the ring nebula really is. Previous photographs, taken with the former silver coating on the mirror, did not disclose the faint outlying portion of the nebula and, hence, led to the smaller estimates of the nebula's size.

The appearance of the Lyra nebula, Dr. Duncan explained, is now very similar to a small planetary nebula in Andromeda which, though well known to astronomers, is not to be confused with the "great nebula" of that constellation.

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# IN SCIEN

RADIO

## Picture Radioed London and New York Simultaneously

FIRST photographs of Sir Malcolm Campbell's Bluebird racer speeding at 300 miles an hour over the Utah salt flats were dropped off in New York City on their way to London by radio transmission, it has been disclosed by the Radio Corporation of America.

London and New York received the much-wanted photographs at almost exactly the same instant and by the same set of signals from the transmitter in San Francisco.

The trick was to "split" the San Francisco signals into two parts at New York; one part activating the photographic recording device there and the other operating the trans-Atlantic transmitter at Rocky Point, L. I., which sent the radio equivalent of the pictures on to London.

Not only was time saved by the new method, but the picture received in London was as clear as the one in New York. Previously the replica of the New York picture was retransmitted and gave a double screen effect comparable with the fuzziness obtained when one attempts to make a photo-engraving from a newspaper halftone instead of from the original photograph.

*Science News Letter, September 28, 1935*

POULTRY HUSBANDRY

## Chickens Now Tattooed To Foil Fowl Thieves

CHICKENS, tattooed on the wing, may soon become the present-day counterparts of the flank-branded cattle and horses of the Old West, and for the same reason—to foil thieves.

A system of identification, endorsed by the Northeastern Poultry Producers' Association, is based on needle-punctures made in the skin-webs of chickens' wings and then filled with indelible ink. Each poultry-raiser has his own "brand," which is registered, and entered in identification books distributed to law-enforcement agencies. Since the marks cannot be removed, even by boiling the chicken, this system may end large-scale thieving.

*Science News Letter, September 28, 1935*

# FIELDS

PHYSIOLOGY

## Explains Why Sunburn Is Worse After Swimming

A THIN coat of perspiration gives protection against sunburn by absorbing some of the sun rays that burn, Prof. William H. Crew of New York University states. (*Nature*, Aug. 31).

His findings also explain why sunburn is usually more severe on a windy day or after swimming. The wind dries up the perspiration and the water washes it off.

Sunburn is induced principally by light of wavelengths between 2900 and 3100 Angstrom units, Prof. Crew points out. By careful physical measurements he found that a film of sweat one millimeter thick, which is about as thick as three sheets of a newspaper, absorbs light slightly at 3300 Angstrom units, very appreciably at 2900 Angstrom units and is practically opaque for 2700 Angstrom units.

Uric acid is probably the constituent of human perspiration which is the chief light-absorbing agent.

*Science News Letter, September 28, 1935*

PHYSIOLOGY

## College Girls Don't Like Cauliflower or Coffee

CAULIFLOWER, onions and coffee head the list of foods disliked by a group of college girls, and cabbage, tomatoes and peppers are the foods most commonly blamed by the girls for causing indigestion, Drs. W. C. Alvarez, H. C. Hinshaw and Ruth J. Frank have reported to the Mayo Clinic.

The information was obtained from 100 college girls of Spartanburg, S. C., who were questioned as to their food tastes by Dr. Frank. Drs. Alvarez and Hinshaw, of the Mayo Clinic, wanted the information to round out a study they recently made of patients coming to the clinic suffering from functional types of indigestion. In this earlier study they found that 100 per cent. of such patients avoid eating one or more foods for fear of indigestion or discomfort of some kind.

What percentage of persons in the nation are similarly handicapped, Dr. Alvarez and associates wanted to know next. The question is partly answered by the information from the college girls.

Of the hundred girls, only nine ate everything put before them, and 44 had aversion to a number of commonly used foods. No one complained of violent reactions to food. Thirty-six suffered indigestion with certain foods and eleven more believed that certain foods were responsible for hives, eczema and acne. In 47 cases either the girl or a close relative had an allergic sensitiveness to foods.

Besides cabbage, tomatoes, and peppers, the other foods most commonly blamed by the girls for indigestion were onions, fats, peanuts, strawberries, cucumbers and chocolate. The foods most commonly disliked were cauliflower, onions, coffee, cabbage, cucumbers, "sour foods," milk, pickles, peppers, radishes, and pork.

*Science News Letter, September 28, 1935*

SURGERY

## Gelatin Noses and Ears To Replace Those Injured

NOSES, ears or other facial features made of gelatin and applied with a mastic cement were described by Dr. Oscar V. Batson of Philadelphia to the American Academy of Ophthalmology and Otolaryngology.

When the features have been destroyed by disease, accident or curative measures to such a degree that the patient feels himself disfigured, it is the duty of the physician to remove if possible the stigma, fancied or real, Dr. Batson declared. Plastic surgical measures should be considered first in such cases, but if the vitality of the skin has been lowered, they may not succeed.

For such cases Dr. Batson advised the use of artificial features or prostheses, to use the medical term. He considers gelatin the most satisfactory substance because it is flexible, moves with the changing expression and can be attached without mechanical support. In a suitable patient, Dr. Batson said, the gelatin prostheses are not obvious to the observer at conversational distance.

The gelatin artificial features are made by pouring gelatin, colored to match the skin, into molds made from wax models of the features to be restored. They are held in place on the face with a mastic cement. Depending on the time of year and the character of the patient's skin, they last from one to ten days. However, the patient may be supplied with moulds, suitably colored gelatin and cement, and can learn to make and apply his own features as needed.

*Science News Letter, September 28, 1935*

CHEMISTRY

## Chemists Solve Problem For Home Jelly Makers

CHEMISTS at the Delaware Experiment Station, in Newark, triumphantly believe they have solved a big problem for home jelly makers—how to figure the quantity of sugar a jelly mixture needs.

Christening the device the "Jelmeter," George L. Baker, assistant chemist of the station, who invented it, states that it will take the guesswork out of jelly making.

Grandmother, and even mother, knew no way except guesswork to figure the sugar for a jelly mixture, explains Miss Pearl MacDonald of the Extension Service. When they followed a general "pound for pound" rule, the jelly might be perfect, or too sticky, or too stiff. The uncertain factor is the varying amount of pectin in the fruit juices used. It is this pectin which, with sufficient sugar and acid, makes it possible to produce a jelly.

Mr. Baker's invention is a viscosity tube which may remind the housewife somewhat of an hourglass. It measures the flow time of a fruit juice. If the juice takes a minute to flow between marks on the tube, the jelly will need sugar according to one-minute flow time as shown on a direction table.

Delaware's Agricultural Experiment Station has reduced its jelly tests and studies to a "Delaware Method of Jelly Making."

*Science News Letter, September 28, 1935*

SEISMOLOGY

## Earthquake Near Equator In New Guinea Region

A VERY strong earthquake occurred in the region of the north coast of the island of New Guinea, in the East Indies, on Thursday evening, Sept. 19, at 8:48.8 o'clock, Eastern Standard Time. The location of the epicenter was given as in latitude 3.5 degrees north, 141 degrees east, by the U. S. Coast and Geodetic Survey and the Jesuit Seismological Association, after collating data gathered by wire and radio by Science Service.

Stations reporting were those of the Philippine Observatory, Manila; the Dominion Observatory, Ottawa; Georgetown University, Washington, D. C.; the University of Michigan, Ann Arbor; the University of California, Berkeley; St. Louis University, St. Louis, Mo.; and the observatories of the U. S. Coast and Geodetic Survey at Chicago and Honolulu.

*Science News Letter, September 28, 1935*

ASTRONOMY

# Now Come the Winter Stars

## Conspicuous in the Evening Sky This Month Are Famed Pegasus, Andromeda, and the "Northern Cross"

By JAMES STOKLEY

TO THE evening skies of October come the first of the stars that will make the heavens of winter brilliant. A good "sky-mark," with which to start to find them, is seen high in the south, the "great square of Pegasus." This is shown on the accompanying maps, which depict the skies seen from the United States at ten p.m., October 1; nine p.m., October 15; and eight p.m., October 30. The four stars, of similar brilliance, form a square that is easily found. Three are in the constellation of Pegasus, the winged horse, but the one in the upper left-hand corner is Alpheratz, in the next-door constellation of Andromeda, the princess who was chained to the rock.

Below and to the west of the square is the planet Saturn, shining with a steady glow that readily distinguishes it from the stars, most of which it exceeds in brilliance. Saturn is in Aquarius, the water-carrier. The little triangle of stars just above it, with a fourth star at the center, is supposed to represent the pot of water, from which a stream is flowing southward. Below Aquarius is Fomalhaut, about all that can be seen of Piscis Austrinus, the southern fish. If the sky is very clear to the south, you may be able to see, still nearer the horizon, stars marking parts of the constellations of Phoenix and Grus, the crane. In the United States, these never rise any higher than now, but in southern countries they shine overhead.

### Fishes and Whale

Below, and also to the eastern side of the Great Square, is the group of Pisces, the fishes. Below them, in the southeast, is Cetus, the whale. Continuing farther to the north, about the same height, is Taurus, the bull. The red star, Aldebaran, is brightest in this group, and marks the animal's eye, and the V-shaped group of which it is part outlines the face. Above is a little cluster of stars, the Pleiades, in his shoulder. Next to Taurus, still farther north, is Auriga, the charioteer, with the first magnitude Capella. Perseus, the champion, is seen over him, and still higher, like a letter W on one side, is Cassiopeia, the queen of Ethiopia, seated on her throne.

The familiar "Great Dipper" this month is almost at its lowest position in the evening, but because it is closer than the horizon to the north pole of the sky, around which all the stars circle, it never goes below it. In other words, it is one of the "circumpolar" constellations, which never set. The "pointers," to the right, indicate the direction of Polaris, above. This is close to the celestial pole, and is at the end of the handle of the little dipper, which extends to the left. Winding its snake-like body between the two dippers, can be seen the dragon, Draco, with the head in the northwestern sky, just north of Lyra, the lyre, with the brilliant Vega. Below them is Hercules, the strong man.

### In the West

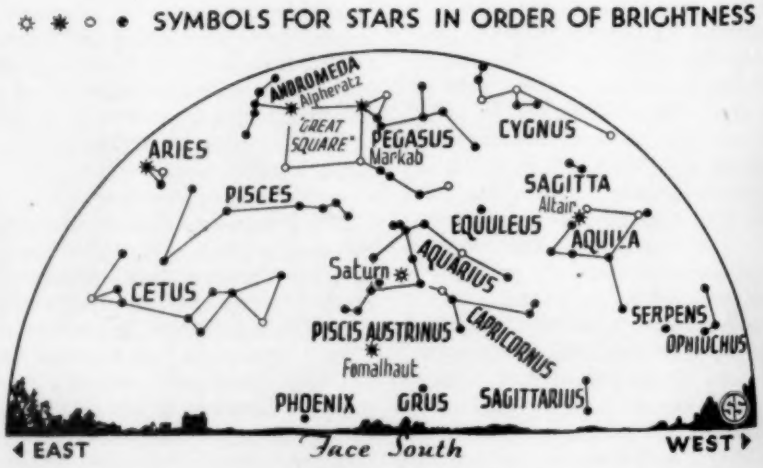
Most conspicuous of the constellations in the west is Cygnus, the swan, also called the "northern cross." The cross is nearly vertical, with Deneb at the top, marking the tail of the swan. Directly below is Lyra, the lyre, with Vega, and farther south is the eagle, Aquila, with the bright star Altair. Over it is Sagitta, the arrow, a small and rather faint constellation, and just to the left of that is Delphinus, the dolphin, another small group in which is the diamond-shaped figure of "Job's coffin."

Two other planets can be seen in the early evening this month, though they have set by the time for which the maps are drawn. Low in the southwest, during the first half of the month, Jupiter can be seen when it first gets dark. It is rapidly drawing into line with the sun, though it is much farther beyond, and by the end of October will set so soon after sunset that it will not be visible. Even after it has gone, however, Mars will still be in view, also in the southwest, in the constellation of Ophiuchus, the serpent-bearer.

### Morning Star

In the early morning, rising about three and a half hours before the sun, Venus can be seen to the southeast. It reaches its greatest brilliancy on the fifteenth, of magnitude minus 4.3, much brighter than any other star or planet. On the morning of the 23d, the crescent of the waning moon will appear a short distance to its north. Mercury is now drawing to the west of the sun, and will be at its greatest distance on November 2, so during the last few days of this month, it will also be a morning "star," visible in the southeast at dawn.

The moon is at first quarter this month on the fifth, full on the eleventh, at last quarter on the nineteenth and new on the twenty-seventh, so that the evenings during the first two weeks will be moon-lit. On October 10, at 11:36 p.m., E.S.T., the moon will be closest, at "perigee,"




A "SKYMARK"

*The "great square of Pegasus" is an easily located pattern among the stars from which others can be traced.*

**FLYING HIGH**

***This month Cygnus, the swan, also known as the "Northern Cross" is high in the northern heavens.***

222,800 miles away. It will be farthest, at "apogee," on the twenty-third, at 8:24 a.m., when 252,100 miles will separate us.

The brightest star to be seen this month in the evening is Vega, in the constellation of Lyra. Just below it, near a faint star in Hercules, is the point towards which the sun, and the rest of the solar system with it, is traveling at a speed of 12.3 miles per second. The great English astronomer of the 18th century, Sir William Herschel, was the first to detect this movement, from a study of the motions of the stars across the sky. Suppose that you are driving in an automobile through a long tunnel. Pick out two points on opposite walls some distance ahead, perhaps two lights. As you approach, they seem to separate, but after you have passed them, and look back (if you are not driving the car yourself!) you will find them apparently to be drawing together.

### Similarly With Stars

The same thing happens with the stars. In the direction towards which the solar system is moving, they appear to be drawing apart, and in the opposite direction, that which we are leaving, they tend to draw together. Of course, the stars have their own motions, which may mask the effect in individual cases, but if we consider large numbers, these average out. Another English astronomer, James Bradley, had pointed out that this would happen, and a German, Tobias Mayer, had sought for it, though his data were insufficient. But Herschel, in 1783, announced that from a study of thirteen stars, he had found such an effect, when he wrote, with characteristic modesty:

"Now, since the apparent motions of these stars may be accounted for, either by supposing them to move just in the manner they appear to do, or else by supposing the sun alone to have a motion in a direction, somehow not far from that which I have assigned to it, I think we are no more authorized to suppose the sun at rest than we should be to deny the diurnal motion of the earth, except in this respect, that the proofs of the latter are very numerous, whereas the former rest only on a few though capital testimonies."

### Since Confirmed

Since that time, however, it has been abundantly confirmed. In 1837, a German astronomer, Argelander, obtained similar results from the study of many more stars. In recent years, in addition, the spectroscope has checked it in another way. By observing the exact position of the dark lines that appear crossing the band of color, or spectrum, that is obtained when a star's light is passed through the prisms of a spectroscope, it is possible to tell whether the distance between that star and the earth is getting greater or smaller. In the former case, the lines are shifted to the red end of the spectrum, but in the latter, the shift is towards the blue. Here, again, various stars have their own individual motions of approach or recession, called radial velocities, but these average out in large enough numbers.

If a shift to the red is observed, it means either that the star is moving away from the earth, or the earth away from the star; in either event the distance is increasing. Similarly, a blueward shift may mean that the earth is approaching the star, or the star the earth. If it is found that most of the stars in one direction show the red shift, while most in the opposite have their spectral lines moved to the blue, the reasonable assumption is that we are moving towards the latter direction. This is especially convincing if it is found that this is the same part of the sky towards which the transverse motions of the stars show us to be traveling.

The most complete studies of the motion of the solar system, from radial velocities, has been made at the Lick Observatory in California, by Dr. W. W. Campbell and Dr. J. H. Moore. After more than thirty years of research, with stars observed from the observatory in California as well as from a southern station in Chile, they announced their final result in 1928, and it is almost the same as that obtained by the other method.

### Earth Moves in Helix

Of course, if the earth is moving around the sun in a circle, and the sun itself is moving through space, it is perfectly obvious that our motion in space is not that of a circle, but a helix, the same as that of a man ascending a spiral stairway. Surely so keen a thinker as Herschel could not have failed to notice this, though he does not seem to have mentioned it in any of his writings. But since then many other writers, of the past and present century, have described it. In spite of this, however, some one will occasionally realize it for the first time, and, because they may have seen a statement in a book that the earth's orbital motion is an ellipse, almost circular, they think that they have made a great discovery. How can the book be correct, in saying the earth moves in a circle, when it really moves in a helix? They totally overlook the fact that the author was referring only to motions within the solar system, when it is perfectly correct to say that the earth's motion, around the sun, is in an ellipse.

### Presenting "New" Truth

Having made this "discovery," a frequent procedure is to attempt to present a paper on the subject before some scientific body, an offer which is quite naturally rejected. Then delusions of persecution are apt to develop, and the "great thinker" may publish a pamphlet at his own expense, setting forth how ignorant the astronomers have been for so many years, and how backward they are in not accepting a "new" truth when he offers it to them. Interest in astronomy, and popular knowledge of it, has increased tremendously in the last few years, but it will have to be spread much further yet before we have seen the last of these "discoverers."

*Science News Letter, September 28, 1935*

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Southern California is trying a new venture—perfume farming.

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The census of 1931 credits India with almost 353 million people, which is nearly one-fifth the world's population.

PSYCHOLOGY

# Says Psychology is Neglected In New Deal Recovery Program

THE depression offers a challenge to psychologists to tackle the problems of life and the community that is as pressing as was the call of the Great War, Dr. A. L. Poffenberger, of Columbia University, told members of the American Psychological Association in his presidential address.

Both President Roosevelt and General Hugh S. Johnson, as spokesmen for the New Deal, were quoted by Dr. Poffenberger as attributing the present economic emergency to fear. And fear is a psychological ill, calling for psychological treatment, Dr. Poffenberger explained.

Yet despite the recognition of the psychological basis for the nation's difficulties, the Government has failed to call on psychologists for expert assistance, Dr. Poffenberger maintained, as did President Wilson during the World War when the leading psychologists of the nation gathered in Washington to pool their talents for the service of the nation.

"There was no psychologist in the 'brain trust,'" said Dr. Poffenberger, who is himself a member of the faculty at Columbia University, noted for its contribution to the group of brain trusters in Washington.

"There was no psychological component in the long list of proposals for the contribution of science to a long term recovery program.

"There was no psychologist included in the Science Advisory Board of the National Academy of Sciences and the National Research Council to advise the Government where science touches governmental operations.

"There is no psychological service set up as an integral part of the Civilian Conservation Corps, that organization whose function it is to salvage, develop, and guide the young men of our country.

"There is no call upon the psychologist for help in the aviation activities of the Government in its divisions of Army, Navy, and Commerce, where psychological problems of the long recognized 'personal equation' are so numerous.

"The Wickersham Commission for the Survey of Crime in the United States included no psychologist.

"One notable exception to this neglect of what the psychologist has to offer is to be found in the program of the United States employment service in the Department of Labor. This exceptional instance is due to the courage and the far-sightedness of a few leaders in this movement, who recognize the fundamentals underlying the problems of employment.

"The success of the psychological contribution depends upon how well it is kept under cover. However valuable the psychological work may be, diplomacy dictates that it shall function under an assumed name." Dr. Poffenberger here referred to the employment in the Government service of psychologists as "statisticians" or "economists" instead of openly as psychologists.

Pushing their service to the community, and thus protecting the public from poorly trained psychologists and psychological quacks was urged upon his colleagues by Dr. Poffenberger.

*Science News Letter, September 28, 1935*

PSYCHOLOGY

## Act to Salvage Nation's Intellectual Resources

SALVAGING the nation's intellectual resources is the aim of action taken by the American Psychological Association at its business meeting.

Scientifically trained psychologists now throwing away their talents in "leaf-raking" or idleness should be given a chance to put their minds to work in projects that would relieve the depression, members said in discussing a resolution for this purpose passed at the business session.

Employment offices are in urgent need of psychologists. Schools need help in training and guiding youth for jobs in this new era. The crime problem today demands psychological research, it was explained.

Petitions have been received by the Association from hundreds of scientific men throughout the whole country protesting at the waste of intellect and education when psychologists with seven years of professional training, eager to tackle these social problems, are sitting in idleness or employed at cutting grass along the public highways.

This "plowing under" of human minds, as it was termed, raised the storm of protest represented by a fat folder of petitions presented to the meeting by its secretary, Dr. Donald G. Paterson, of the University of Minnesota.

A committee was appointed, headed by Dr. A. T. Poffenberger of Columbia University, who is already familiar with the situation from his association with the National Research Council in Washington. This committee was instructed to secure and have available a list of psychologists not now employed in their profession or some other socially useful work. They are also empowered to do whatever is feasible to place these men and to present approved scientific projects to state and federal administrators of work relief.

*Science News Letter, September 28, 1935*

ARCHAEOLOGY

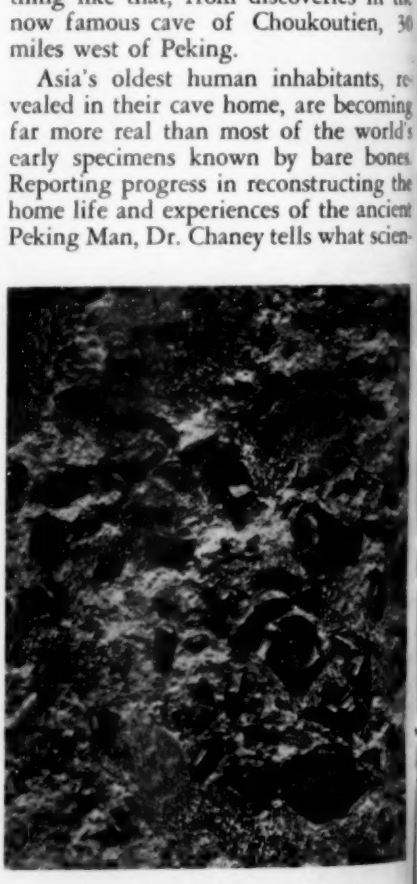
## Hackberries May Have Been The Cave Child's Spinach

"NOW EAT your nice hackberry pudding. It's good for you."

Was this what the cave man's child had to listen to, at meal time in China almost a million years ago?

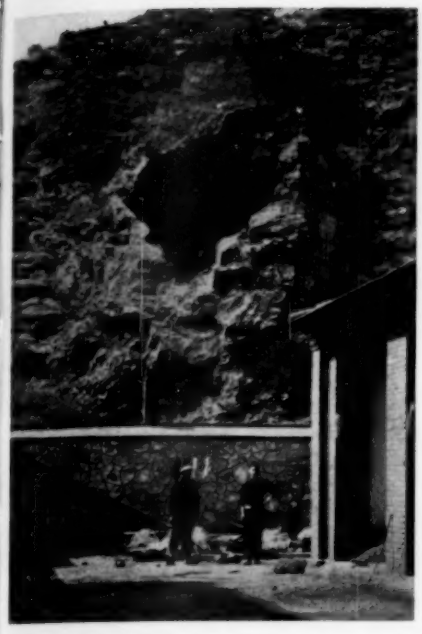
Dr. Ralph W. Chaney, research associate of the Carnegie Institution of Washington, is inclined to think life was something like that, from discoveries in the now famous cave of Choukoutien, 30 miles west of Peking.

Asia's oldest human inhabitants, revealed in their cave home, are becoming far more real than most of the world's early specimens known by bare bones. Reporting progress in reconstructing the home life and experiences of the ancient Peking Man, Dr. Chaney tells what scien-



**FROM AN ANCIENT MEAL**

***Shells of hackberries recovered from where they were probably discarded by the Peking Woman after a dinner about a million years ago.***



**CAVE MAN'S HOME**

***In rock caves such as that shown above, were found remains of long-extinct animals and also traces left behind by prehistoric man—his food, tools, bones from his roasts. The building at the right is the laboratory of the National Geological Survey of China at Choukoutien near Peking. This photograph and that on the facing page were furnished by the Carnegie Institution of Washington.***

tific deduction makes of a layer of thousands of broken hackberry shells in the cave floor. American hackberries in the Southwest today are commonplace food to Indians who eat the berries raw, and also use them as flavoring for meat or bread. If the innumerable shells in Peking Man's cave were cracked by him for the seed-food inside, that is an important bit of news about man's diet almost a million years ago. If mere rodents ate them, not so important.

Authorities consulted by Dr. Chaney believed rodents would chew a hole, rather than crack shells. Caged rodents put to the test unfortunately refused to take any interest in hackberries. Caged monkeys were more responsive. They ate shell and all.

Altogether, Dr. Chaney concludes, it was probably Peking Man who left the shells, who gathered the hackberries from bushes and mashed them in preparing his meals.

"We can almost hear Peking Woman," says Dr. Chaney, "adjuring Peking Child, in a language lost in the obscurity of a million years, to eat his hackberry pudding in lieu of orange juice, or other vitamin-containing foods of the modern diet."

Peking Woman could talk, for the brain cavity in the skull of this ancient type shows there was capability of speech. It is also demonstrated that Peking Man lived in caves, and made campfires to cook his food or to warm himself. Whatever part hackberries played in his diet, he was no vegetarian, for his Asiatic cave has yielded abundant fragments of charred animal bones.

The burned bones, Dr. Chaney says, indicate "that here were cooked choice cuts of horse, bison, rhinoceros, and other game animals which ranged the Western Hills and adjacent plains during the past, and which have no living relatives in North China today."

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GEOGRAPHY

# Lake in Sahara Seen As The Next Desire of Italy

ETHIOPIA is not the only slice of Africa on which Italian imperialism has fixed hungry eyes. Over a thousand miles due west of Ethiopia, Lake Chad in the Sahara Desert marks another region which Mussolini could well use in his plans for greater Italy.

In all the vast Sahara, this is the one danger spot for international diplomacy foreseen by Prof. E.-F. Gautier of the University of Algiers. Prof. Gautier, noted for his scientific studies of the life and geology of the great African desert, has just seen his famous French work on the Sahara translated into English ("Sahara, the Great Desert"), with the news of present day Sahara happenings worked into a new chapter.

The Sahara has been radically transformed since the World War, Prof. Gautier finds. Necessity proved the mother of invention, when Turkish and Senusi drives in North Africa during the World War forced the armies to try inventions supposedly hopeless for desert application. Wireless telegraph systems worked so excellently that they became permanent, thereby as Prof. Gautier says, "furnishing a powerful auxiliary for keeping peace, order, and security in the desert by permitting every bit of news in the interior to be transmitted immediately to the local and central authorities, who can communicate and execute their decisions with the same dispatch."

The outside world, also, was brought in close touch with far-flung desert posts, with many advantages, by the telegraphic system.

Automobiles were forced to adapt themselves to the desert, to meet wartime problems. Immediately, says Prof. Gautier, it was discovered that the desert floor offers astonishing facilities for traction. Gasoline, extravagantly high, is still a problem for Sahara travelers, but cars with six-braked wheels and even ordinary cars go everywhere, following the road signs and driven by chauffeurs who form what Prof. Gautier calls a kind of new nomadic tribe. Legionnaires, Frenchmen, and Russian exiles are types who have joined this new desert calling.

In Libya, on the Mediterranean, the Italians have completely discarded camel caravans for official use, and depend entirely on motor transport, says Prof. Gautier.

As elsewhere in the world, the duel between motor highways and railroads is keen in the Sahara. Both systems are making progress.

It is an Italian railroad ambition that causes the French scientist to cast a

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troubled look toward Lake Chad in the heart of the Sahara, lying on a direct north and south route between Italy's North African provinces and the Atlantic Ocean.

"Italy, under Mussolini, would like to construct a trans-Saharan railway from Tripoli to Lake Chad and thence to the Ocean; and would prefer one entirely Italian," writes Prof. Gautier. "The realization of this project would require France to cede to Italy not only the Chad basin, but also the mandate over the Cameroons; but French public opinion is certainly not prepared to make any such important concession. Chad would seem to be the only portion of the Sahara which threatens to trouble European diplomacy, which has no need for even this small addition to existing complications."

*Science News Letter, September 28, 1935*

MEDICINE

# Oxygen Injections May Become Life-Saving Means

## Experiment by Indian Student in England Keeps Dog Alive 16 Minutes In Pressure Chamber

OXYGEN injected into the veins may become an important means of saving lives in cases of drowning, diffuse broncho-pneumonia and perhaps other conditions in which breathing is hampered or stopped. Such a method of treatment is not practical at present, but the first step toward making it so seems to have been taken by Dr. I. Singh, working at Cambridge University and the Medical College at Rangoon.

A dog was kept alive by this injection method for sixteen minutes without breathing oxygen through the lungs, Dr. Singh reported to the Physiological Society.

The oxygen was supplied to the animal by injection into its veins under an increased atmospheric pressure amounting to three atmospheres. A fault in the injecting apparatus which allowed a sudden gush of oxygen into the veins was apparently all that kept the experiment from continuing much longer.

A way to get oxygen into the blood when disease or accident prevents the lungs from doing adequately this job which is their normal function would be highly desirable, the editor of *The Lancet* (Aug. 17) points out in calling it to the attention of physicians. Previous workers have tried injecting oxygen into the veins but have found it impossible to give human patients more than very small amounts because of the danger of clogging the veins with air-bubbles. The amounts that could heretofore be given this way have not been scientifically justifiable in treating conditions of oxygen lack.

Dr. Singh's experiments seem to point the way toward a means of giving sufficiently large doses of oxygen by vein. Application of this advance to treatment of human patients will be the next step but a very difficult one.

Working with cats and other animals, Dr. Singh found first that the amount of oxygen the animal could absorb depended on such factors as the distance from the heart and lungs at which the gas was injected and the caliber of the veins along which the bubbles travel.

The size of the veins, however, limited the amount of oxygen that could be absorbed at ordinary pressure. Further experiments showed that increasing the pressure increased enormously the amount of oxygen that could be absorbed. At the pressure of three atmospheres, all the oxygen the dog needed could be supplied through his veins.

During the experiment the dog's breathing was almost normal. A soda-lime tube attached to the windpipe absorbed the expired carbon dioxide. The experiment had to be performed in the pressure chamber.

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**●RADIO**

*Tuesday, October 1, 4:30 p. m., E.S.T.*

**FOSSIL FOODS, by Dr. Ralph W. Chaney, Professor of Paleontology, University of California.**

*Tuesday, October 8, 4:30 p. m., E.S.T.*

**WORLD'S OLDEST LANGUAGE—ETHIOPIAN, by Dr. John P. Harrington, Bureau of American Ethnology, Smithsonian Institution.**

**In the Science Service series of radio addresses given by eminent scientists over the Columbia Broadcasting System.**

PHYSIOLOGY

# New "Finger-Printing" For Blood Pressure Tendency

BLOOD-pressure "finger printing" may in the future be used to test every school child from five to eighteen. This is the name Drs. E. A. Hines, Jr., and G. E. Brown of the Mayo Clinic's division of medicine suggest for the test given in their experiments to show whether a child has a tendency towards high blood pressure. The test also shows that high blood pressure is hereditary.

They used what is known medically as the standard cold pressor test in their experiments with 400 children, varying in age from five to eighteen. They found that 18 per cent. were what they called hyper-reactors.

In the cold pressor test the subject rests supinely for thirty minutes. During that time several blood pressure readings are made to establish a basal level. One hand is then immersed over the wrist in a bucket of ice water, and readings are made from the opposite arm at intervals of thirty seconds. After the hand is withdrawn from the ice water, readings are made every two minutes until the blood pressure returns to its previous basal level. The response usually comes within thirty seconds. If a person does not have a tendency to high blood pressure, the blood pressure goes back to its value before the test within two minutes after the hand has been withdrawn from the water.

When family histories were taken of the children showing a tendency to high blood pressure, it was found that 76 per cent. gave a history of hypertension, whereas only 14 per cent. of those with a normal reaction gave a history of hypertension in the family.

Tests were also made on 190 persons belonging to fifteen families. In six of these families there was no history of hypertensive cardiovascular disease, and the tests showed a normal reaction to the cold pressor tests.

The Mayo Clinic investigators believe from their experiments, which have been carried on over a period of three years in which they have studied a large group of subjects, that vasomotor reactions are inherited characteristics and the tendency of an individual as to blood pressure can be accurately told in children of school age.

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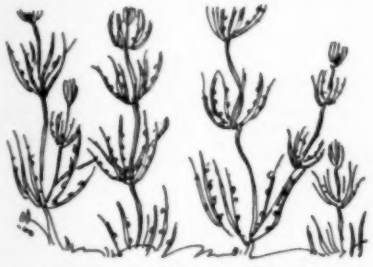
Australians made a drive against noisy kingfishers some years ago, not realizing that the birds were keeping snakes in check.

BIOLOGY

## NATURE RAMBLINGS
*by Frank Thone*



**Whence Plants, Then?**

SALT in the blood has for many years been accepted as evidence that all life originated in the sea. The blood of humans and other vertebrates is astonishingly like sea water in many respects. It has about the same concentration of common salt, sodium chloride. It has the same chemical makeup as sea water in the other salts which it contains in lesser quantities.

The blood of our most distant animal kindred, the invertebrates, also seems to lend support to the same hypothesis. It also has common salt as its preponderating mineral constituent, and it contains the other sea salts as well. This is true both for the invertebrates that still live in the sea, like starfishes and oysters, and for those that live on land or in fresh water, like worms, insects and cray-fishes. Invertebrate blood, however, departs from the sea-water standard of salt concentration more than does the blood of the backboned animals. This is taken by some physiologists as a possible indication of the state of the sea when the ancestors of these creatures first evolved.

But this smooth-running theory strikes a snag when it comes to the land plants. The body-fluids of practically all of them, from the humblest green scum on stagnant pools to the mighty redwoods on the California hills, from waterlilies to cacti, are almost as salt-free as the water that flows from your bathroom tap. Travelers in the desert often slake their thirst by chopping open giant cacti and squeezing their juicy pulp, it is so nearly the equivalent of ordinary fresh water.

A few seashore and salt-desert plants do accumulate a good deal of salt in their tissues, but these are always thought of as "salt tolerant," not salt requiring. To the great majority of plants, even the desert-like forms that grow among the salt-bushes along the strand, salt in sea-water concentration is plain rank poison.

True, practically all land plants do contain a little salt. But that apparently is simply because there is some salt in almost all soils, and they take in this minimum indifferently; they seem to be able to get along without it quite easily. Even submerged seaweed, if burned to ash, yield more potassium bromide than they do of its common-salt kin-compound, sodium chloride.

What does this signify? That the first plants came ashore long before the first animals ventured out, while the sea was still filled with fresh water? That the plants were once salt-filled, too, but somehow lost the "internal sea" that every animal carries about in its veins? That, contrary to most present-day evolutionary assumptions, animals and plants were not derived from the same ancestral cell? Who knows? Any guess is as good as any other!

*Science News Letter, September 28, 1935*

MEDICINE

# Anemia Remedy Finds New Use in Smallpox Treatment

LIVER, life-saving remedy in pernicious anemia, has been put to a new use in the treatment of smallpox.

Liver extract, injected into the muscles, can check the eruption of smallpox at any stage of the disease, shorten the usual length of its course, and prevent the development of pustules and the consequent scarring and pitting, as well as improving the general health of the patient, Dr. V. Govindan Nair of Vizagapatam College in the Madras Presidency has found.

Smallpox can be prevented by vaccination and by this means is now held in check throughout the civilized world. It still ravages the hinterland of less enlightened countries, however, and there seems to be a reversion to the severe type of the disease in many outbreaks in countries where the mild type usually prevails.

Dr. Nair, assisted by Dr. T. S. Adisubramaniam, medical officer of health, and other noted medical men of India, used the liver extract in treating 28 patients during the recent severe smallpox epidemic in Vizagapatam. The relatively small number of cases is accounted for by the fact that in India the disease is considered of divine origin and many of the natives often refuse treatment of any kind since they think it useless. In his report to the *Journal of the Indian Medical Association* (July), Dr. Nair cautions against deductions because of the small number of patients in his series. He is sufficiently encouraged by his results, however, to consider the method worth further trial by other physicians with better facilities and opportunities.

The injections given by Dr. Nair and associates varied with the age of the patient, the stage of the disease and the type. The treatment was begun at the time the papules were erupting and not more than eight or ten injections were given in any one case. In modified types of the disease four or five daily injections were given.

The results were the absence of deep pitting and subsequent disfiguration. In addition to the effect on the skin, the patients recovered much more quickly than when other remedies were used and the systemic effects were greatly mitigated.

For many years doctors have striven not only for a specific treatment for smallpox but also for some means of preventing the disfigurement of the deep scarring and pitting which follows an attack; and there is disagreement as to whether any of the various drugs and treatments are really efficacious.

Dr. Nair and his associates believe that the intra-muscular injection of liver extract strengthens the resistance of the patient, stimulates the liver and bone marrow and promotes the coagulation of blood. They confess it is difficult to understand just why these things have such a beneficial effect upon the lesions in smallpox but think that the fact that liver extract is a powerful haemostatic has much to do with it.

The results of this new remedy open many avenues of research. The investigators suggest that it might be used with advantage in chickenpox, measles, vaccinia, rubella and scarlet fever.

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**Geography**

SAHARA, THE GREAT DESERT—E.-F. Gautier, Translation by Dorothy F. Mayhew—*Columbia University Press,* 264 p., $3.75. Prof. Gautier, well known authority on the great Sahara, tells of its geology, its history, and its life and conveys the mystery and fascination of the region vividly to the reader. The book is not merely a translation, for Miss Mayhew has, with the author's aid, produced an expanded and revised version. A new concluding chapter describes what is happening to the Sahara as Europeans introduce telegraph lines, automobile and airplane routes, and new industries, and as they talk of possibilities of converting sun and wind energy into power.

*Science News Letter, September 28, 1935*

**Geology-Chemistry**

PETROLEUM, THE STORY OF AN AMERICAN INDUSTRY — *American Petroleum Institute,* 95 p., 15c. The second edition of the booklet "Oil," which was published in 1930, is a handy summary of information on the oil industry.

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**Paleontology**

A CORRELATION OF SOME MIOCENE AND PLIOCENE MAMMALIAN ASSEMBLAGES IN NORTH AMERICA AND ASIA WITH A DISCUSSION OF THE MIO-PLIOCENE BOUNDARY—P. Teilhard de Chardin and R. A. Stirton—*Univ. of Calif.,* 13 p., 25c.

*Science News Letter, September 28, 1935*

**Geology**

MESOZOIC AND CENOZOIC ERUPTIVE ROCKS OF THE SOUTHERN KLAMATH MOUNTAINS, CALIFORNIA—Norman E. A. Hinds—*Univ. of Calif.,* 67 p., 75c.

*Science News Letter, September 28, 1935*

**Embryology**

PROBLEMS IN EXPERIMENTAL EMBRYOLOGY—Julian S. Huxley—*Oxford,* 17 p., 35c. In this Boyle lecture Prof. Huxley tells some of the facts scientists have learned about the apparently mysterious process by which the egg develops into the adult animal.

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**Ornithology**

A POPULAR ACCOUNT OF THE BIRD LIFE OF THE FINGER LAKES SECTION OF NEW YORK, WITH MAIN REFERENCE TO THE SUMMER SEASON (ROOSEVELT WILD LIFE BULLETIN, VOL. 6, NO. 3)—Chas. J. Spiker — *Roosevelt Wild Life Forest Experiment Station,* 160 p., 1 map, 50c. This publication, well worthy of the series of which it is a part, will be useful not only in the region for which it is especially written but in considerable adjacent areas.

*Science News Letter, September 28, 1935*

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LES IONOGRAMMES DE LA CONTRACTION MUSCULAIRE — M. Dubuisson — *Hermann et Cie., Paris,* 34 p., 12 francs.

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LES INVERTÉBRÉS; ARTHROPODES, MOLLUSQUES ET ÉCHINODERMES —Georges Bohn—*Hermann et Cie., Paris,* 132 p., 18 francs.

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**Science, Miscellaneous**

POPULAR SCIENCE TALKS, VOL. XII —*Philadelphia College of Pharmacy and Science.* 198 p., $1. Continuation of an interesting series of lectures, made available in printed form. This volume offers such subjects as The Herbs and the Stars, Living Light, Tooth Truths, etc.

*Science News Letter, September 28, 1935*

**Biology**

PHYSIOLOGIE DU DÉVELOPPEMENT ET GÉNÉTIQUE — N. K. Koltzoff — *Hermann et Cie., Paris,* 55 p., 12 francs.

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PHÉNOMÈNES D'INTÉGRATION DANS LES CULTURES DES TISSUS — Boris Ephrussi—*Hermann et Cie., Paris,* 24 p., 8 francs.

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**Biophysics**

L'ÉLECTROACTIVITÉ DANS LA CHIMIE DES CELLULES—René Wurmser—*Hermann et Cie., Paris,* 82 p., 18 francs.

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**Biology**

EXPOSÉS DE BIOMÉTRIE ET DE STATISTIQUE BIOLOGIQUE: V, LES ASSOCIATIONS BIOLOGIQUES AU POINT DE VUE MATHÉMATIQUE — Vito Volterra and Umberto D'Ancona, 96 p., 20 fr.; VI, LE POLYMORPHISME DES MALES DE COLÉOPTÈRES—Renaud Paulian, 33 p., 10 fr. —*Hermann et Cie., Paris.*

*Science News Letter, September 28, 1935*

**Botany**

WEED SEEDS—Emil Korsmo—*G. E. Stechert,* 175 p., 34 colored plates, $10. This book will be indispensable to seed analysts as well as to growers and dealers; agronomists and botanists generally will also find it useful. More than 300 species are figured and given exact trilingual descriptions (Norwegian, German, English). The arrangement is phytosociological rather than taxonomic; this aids in the practical use of the book, yet need not be much of a bother to the systematist. A useful feature is an appendix giving a common-name synonymy in American, Danish, French, Dutch, Italian, Canadian, Norwegian, Russian, Swedish and German.

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**Biology**

MIGRATIONS ET MÉTAMORPHOSES DE L'ANGUILLE D'EUROPE—Léon Bertin—*Hermann et Cie., Paris,* 57 p., 15 francs.

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LA RADIATION COSMIQUE: v. 1, 22 p., 4 pl., 10 francs; v. 2, 24 p., 3 pl., 8 francs; v. 3, 19 p., 1 pl., 7 francs; v. 4, 20 p., 7 pl., 10 francs—*Hermann & Cie., Paris.*

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**Poultry Husbandry**

A GUIDE TO SEXING CHICKS—Charles S. Gibbs—*Orange Judd,* 63 p., $1.25. A brief illustrated text making available to English-speaking poultrymen and teachers of poultry husbandry the technique developed in Japan by Kojima and Sakajiyama.

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